



**THE DATASHEET OF  
ES3A-13**

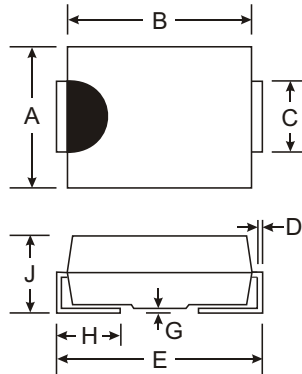


### Features

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Low Forward Voltage Drop and High Current Capability
- Surge Overload Rating to 100A Peak
- Ideally Suited for Automated Assembly
- **Available in Lead Free Finish/RoHS Compliant Version (Note 4)**

### Mechanical Data

- Case: SMB/SMC
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solder Plated Terminal - Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 6, on Page 3
- Polarity: Cathode Band or Cathode Notch
- Mounting Position: Any
- Ordering Information: See Page 3
- Marking: Type Number, See Page 3
- SMB Weight: 0.093 grams (approximate)
- SMC Weight: 0.21 grams (approximate)



Dim	SMB		SMC	
	Min	Max	Min	Max
A	3.30	3.94	5.59	6.22
B	4.06	4.57	6.60	7.11
C	1.96	2.21	2.75	3.18
D	0.15	0.31	0.15	0.31
E	5.00	5.59	7.75	8.13
G	0.10	0.20	0.10	0.20
H	0.76	1.52	0.76	1.52
J	2.00	2.62	2.00	2.62
All Dimensions in mm				

A, B, C, D, Suffix Designates SMC Package  
 AB, BB, CB, DB Suffix Designates SMB Package

### Maximum Ratings and Electrical Characteristics @ T<sub>A</sub> = 25°C unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.  
 For capacitive load, derate current by 20%.

Characteristic	Symbol	ES3A/AB	ES3B/BB	ES3C/CB	ES3D/DB	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	50	100	150	200	V
Working Peak Reverse Voltage	V <sub>RWM</sub>					
DC Blocking Voltage	V <sub>R</sub>					
RMS Reverse Voltage	V <sub>R(RMS)</sub>	35	70	105	140	V
Average Rectified Output Current @ T <sub>T</sub> = 100°C	I <sub>O</sub>	3.0				A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load (JEDEC Method)	I <sub>FSM</sub>	100				A
Forward Voltage @ I <sub>F</sub> = 3.0A	V <sub>FM</sub>	0.9				V
Peak Reverse Current @ T <sub>A</sub> = 25°C at Rated DC Blocking Voltage @ T <sub>A</sub> = 125°C	I <sub>RM</sub>	10 500				μA
Reverse Recovery Time (Note 3)	t <sub>rr</sub>	25				ns
Typical Total Capacitance (Note 2)	C <sub>T</sub>	45				pF
Typical Thermal Resistance, Junction to Terminal (Note 1)	R <sub>θJT</sub>	15				°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150				°C

- Notes:
1. Unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pads as heat sink.
  2. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
  3. Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>rr</sub> = 0.25A. See Figure 5.
  4. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

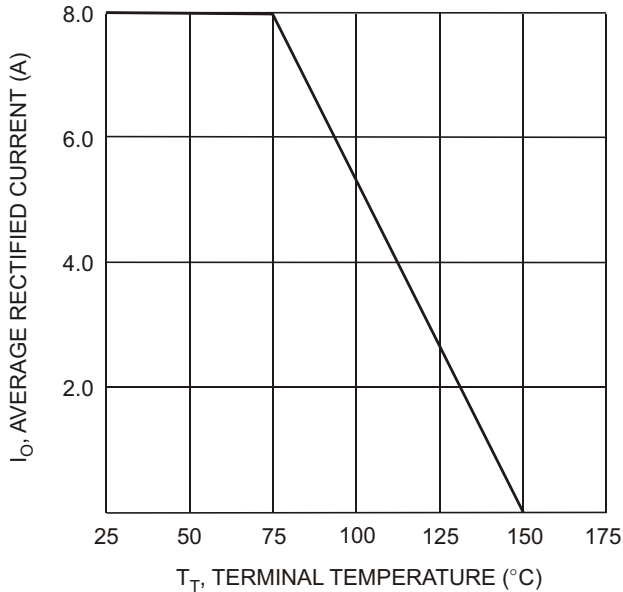


Fig. 1 Forward Current Derating Curve

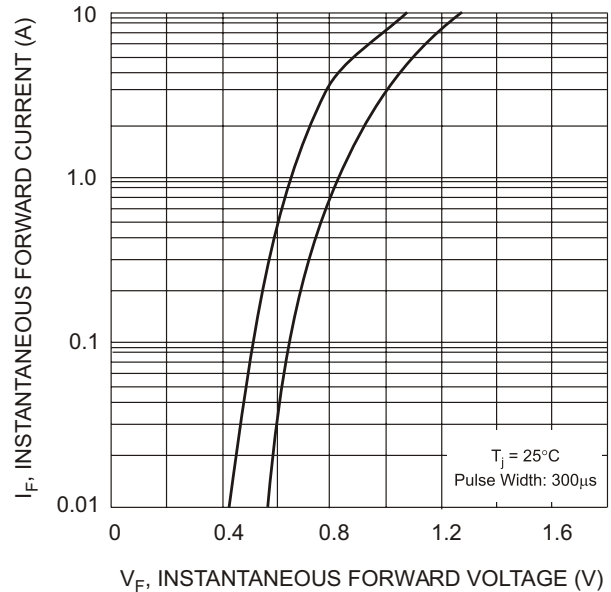


Fig. 2 Typical Forward Characteristics

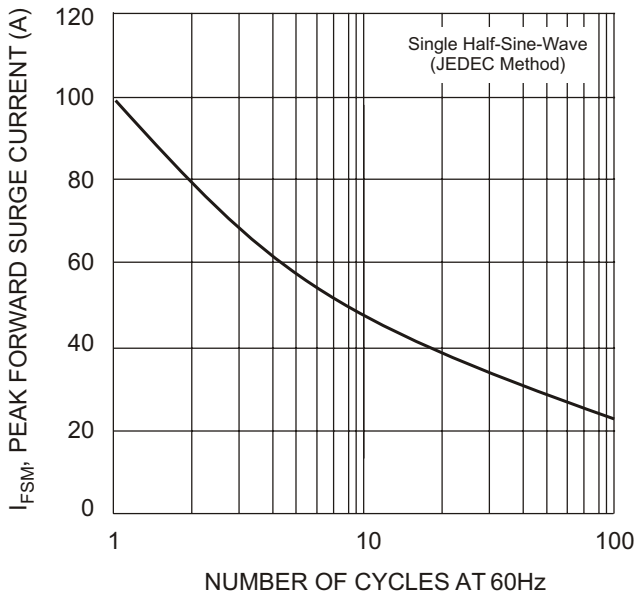


Fig. 3 Surge Current Derating Curve

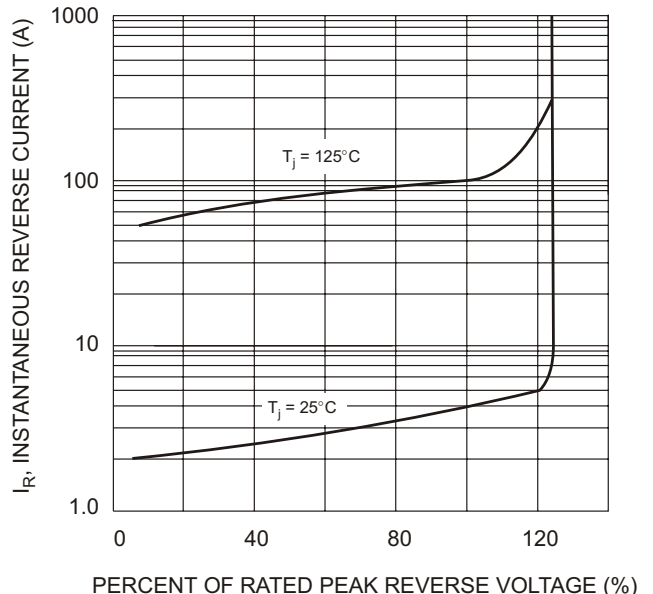
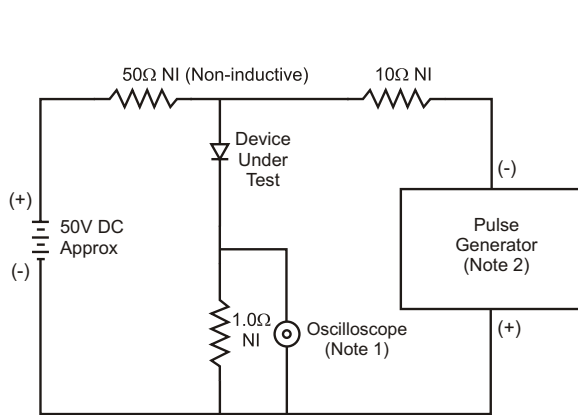
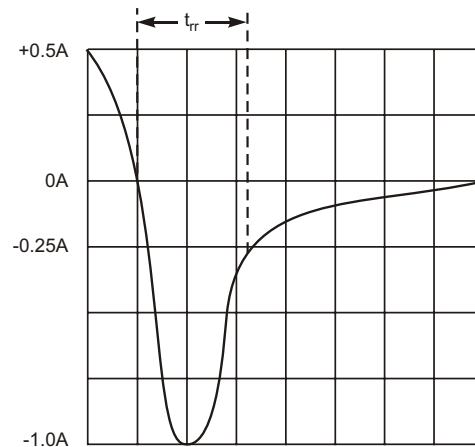


Fig. 4 Typical Reverse Characteristics



- Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
  2. Rise Time = 10ns max. Input Impedance = 50Ω.



Set time base for 50/100 ns/cm

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

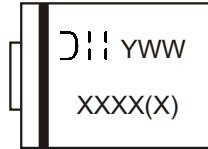
## Ordering Information (Note 5 & 6)

Device*	Packaging	Shipping
ES3x-13 ES3xB-13	SMC SMB	3000/Tape & Reel 3000/Tape & Reel

\* x = Device type, e.g. ES3A-13 (SMC package); ES3AB-13 (SMB package).

- Notes:
4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  5. For Lead Free Finish/RoHS Compliant version part number, please add "-F" suffix to the part number above. Example: ES3A-13-F.



## Marking Information



XXX = Product type marking code, ex: ES3A (SMC package)  
 XXXX = Product type marking code, ex: ES3AB (SMB package)  
 D||| = Manufacturers' code marking  
 YWW = Date code marking  
 Y = Last digit of year ex: 2 for 2002  
 WW = Week code 01 to 52

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